

THAT WHICH IS CLAIMED:

1. An optical tube assembly comprising:

a tube;

at least one optical waveguide, the optical waveguide being  
5 disposed in the tube; and

a dry insert, the dry insert comprising a tape and at least  
one filament attached to the tape so that the at least one  
filament forms a plurality of loops, the dry insert generally  
surrounding the at least one optical waveguide and coupling the  
10 at least optical waveguide with the tube while maintaining an  
optical attenuation below about 0.3 dB/km.

2. The optical tube assembly of claim 1, the dry insert having  
at least one water-swellable substance for blocking the migration  
15 of water along the tube.

3. The optical tube assembly of claim 1, the dry insert being  
compressed by about 10% or more, thereby coupling the at least  
one optical waveguide with the tube.  
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4. The optical tube assembly of claim 3, the dry insert having at  
least one water-swellable substance for blocking the migration of  
water along the tube.

25 5. The optical tube assembly of claim 1, the dry insert being  
compressed by about 90% or less, thereby coupling the at least  
one optical waveguide with the tube.

6. The optical tube assembly of claim 1, the at least one  
30 filament of the dry insert having a water-swellable component.

7. The optical tube assembly of claim 1, the at least one  
optical waveguide and the dry insert forming a core, the core

having a pull-out force between about 0.2 N/m and about 5.0 N/m for a 100 meter length.

8. The optical tube assembly of claim 1, the at least one  
5 optical waveguide and the dry insert forming a core, the core having a pull-out force between about 1 N/m and about 3 N/m for a 100 meter length.

9. The optical tube assembly of claim 1, the dry insert having  
10 the at least one filament attached to the tape so that the uncompressed height of the dry insert is about 5 millimeters or less.

10. The optical tube assembly of claim 1, the dry insert  
15 disposed so that the at least one filament is facing towards the at least one optical waveguide.

11. The optical tube assembly of claim 1, the dry insert having  
the at least one filament on a first side of the tape and a  
20 second filament on a second side of the tape.

12. The optical tube assembly of claim 1, the dry insert having a height  $h$  that varies across a width  $w$  of the dry insert.

25 13. The optical tube assembly of claim 1, the dry insert having a plurality of filaments that are intermittently attached to the tape.

14. The optical tube assembly of claim 1, the optical tube  
30 assembly being a portion of a fiber optic cable.

15. An optical tube assembly comprising:  
a tube, the tube having an interior surface;

at least one optical waveguide, the optical waveguide being disposed in the tube; and

a dry insert, the dry insert comprising a tape and at least one filament attached to the tape, thereby forming a plurality of loops with the filament with either the tape or the at least one filament having a water-swellaable component, wherein the dry insert is compressed at least 10 percent for coupling the at least optical waveguide to the interior surface of the tube.

10 16. The optical tube assembly of claim 15, the compression of the dry insert being about 90% or less.

17. The optical tube assembly of claim 15, the tape of the dry insert being a foam tape.

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18. The optical tube assembly of claim 15, the water-swellaable component being a water-swellaable tape.

19. The optical tube assembly of claim 15, the dry insert having a first type of filament and a second type of filament.

20. The optical tube assembly of claim 15, the at least one optical waveguide and the dry insert forming a core, the core having a pull-out force between about 0.2 N/m and about 5.0 N/m for a 100 meter length.

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21. The optical tube assembly of claim 15, the at least one optical waveguide and the dry insert forming a core, the core having a pull-out force between about 1 N/m and about 3 N/m for a 100 meter length.

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22. The optical tube assembly of claim 15, the dry insert having an uncompressed height of about 5 millimeters or less.

23. The optical tube assembly of claim 15, the dry insert generally surrounding the at least one optical waveguide.

24. The optical tube assembly of claim 15, the at least one  
5 filament of the dry insert having a water-swellaable component.

25. The optical tube assembly of claim 15, the dry insert being formed from two or more water-swellaable components.

10 26. The optical tube assembly of claim 15, the dry insert having a height  $h$  that varies across a width  $w$  of the dry insert.

27. The optical tube assembly of claim 15, the dry insert having a plurality of filaments that are intermittently attached to the  
15 tape.

28. The optical tube assembly of claim 15, the optical tube assembly being a portion of a fiber optic cable.

20 29. An optical tube assembly comprising:  
a tube, the tube having an interior surface;  
at least one optical waveguide, the optical waveguide being disposed in the tube; and  
a dry insert, the dry insert comprising a tape and at least  
25 one filament attached to the tape to form a plurality of loops, wherein the dry insert and the at least one optical waveguide form a core, the core having a pull-out force between about 0.2 N/m and about 5.0 N/m for a 100 meter length.

30 30. The optical tube assembly of claim 29, the at least one optical waveguide and the dry insert forming a core, the core having a pull-out force between about 1 N/m and about 3 N/m for a 100 meter length.

31. The optical tube assembly of claim 30, the dry insert having at least one water-swellaible substance for blocking the migration of water along the tube.

5 32. The optical tube assembly of claim 29, the dry insert having a height  $h$  that varies across a width  $w$  of the dry insert.

33. The optical tube assembly of claim 29, the compression of the dry insert being about 10% or more.

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34. The optical tube assembly of claim 29, the compression of the dry insert being about 90% or less.

35. The optical tube assembly of claim 29, the dry insert having  
15 at least one water-swellaible substance for blocking the migration of water along the tube.

36. The optical tube assembly of claim 34, the dry insert having a first type of filament and a second type of filament.

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37. The optical tube assembly of claim 29, the dry insert having an uncompressed height of about 5 millimeters or less.

38. The optical tube assembly of claim 29, the dry insert having  
25 a plurality of filaments that are intermittently attached to the tape.

39. The optical tube assembly of claim 29, the optical tube assembly being a portion of a fiber optic cable.

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40. A method of manufacturing an optical tube assembly comprising:

paying off at least one optical waveguide;

placing a dry insert adjacent to the at least one waveguide,  
thereby forming a dry core, wherein the dry insert comprises a  
tape and at least one filament attached to the tape so that the  
at least one filament forms a plurality of loops; and

5 extruding a tube around the dry core.

41. The method according to claim 40, the method further  
comprising extruding a cable jacket around the optical tube  
assembly.

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42. The method according to claim 40, the dry insert having at  
least one water-swellable substance for blocking the migration of  
water along the tube.